

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	
Oliver SCHUMACHER	:	
	)	Examiner: COONEY, John M.
U.S. Application No.: 10/524,127	:	
	)	Group Art Unit: 1796
Filed: June 3, 2003	:	
	)	Confirmation No.: 4886
For: LOW EMISSION TIN CATALYSTS	:	
	)	

**MAIL STOP AMENDMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R. § 1.132**

- I, Dr. Oliver Schumacher, a citizen of the Germany, do hereby declare that:
1. I am the inventor for the above-identified patent application.
  2. I have degrees in inorganic chemistry as Diplom-Chemiker (1983) and Doktor der Chemie (1988), both from Westfaelische Wilhelms Universitaet, Muenster, Federal Republic of Germany.
  3. I am presently working in the field of organometallic chemistry, specifically organotin catalysts, and have worked in this field for the past 18 years.
  4. In an organotin catalyst compound of the formula  $R_2SnX_2$ , wherein R is a hydrocarbyl group and X is a carboxylate group, I would expect that R groups having fewer carbon atoms would produce an organotin compound (and a resultant polyurethane compound) having a greater emissivity (greater fogging) into air or water due to the associated activity.
  5. I conducted fogging testing on dimethyltin dioleate, dibutyltin dilaurate, and dimethyltin didecanoate (organotin catalysts). The testing was conducted in the following manner:
    - A dry, clean round piece of aluminum foil (diameter 103 mm, thickness 0.03 mm) was weighed. 5 g of the respective liquid organotin catalyst and 0.5 g of water were placed onto the bottom of a dry and clean glass beaker (inner diameter

-A silicone rubber ring was fitted to the neck of the beaker, the aluminum foil was placed on top of it, and covered with a glass sheet (110 x 110 x 3 mm). The beaker was hung in a thermostated glycerol heating bath in such a way, that the glass sheet was 60 mm above the glycerol level. An aluminum cooling block (connected to another thermostat) was placed onto the glass sheet. For 16 hours, a glycerol bath temperature of 100°C, and a cooling block temperature of 21°C was maintained. Subsequently, the aluminum foil was placed into a dessicator and kept there for 1 hour at room temperature over silica.

-The aluminum foil was then weighed again, and the weight difference (in mg) was recorded as mg of fogging condensate.

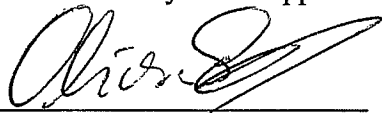
6. I conducted fogging testing on polyurethane foams prepared using dimethyltin dioleate, dibutyltin dilaurate, and dimethyltin dineodecanoate organotin catalysts. The testing was conducted in the following manner:

-The foam samples were cut into round disks (each 80 mm in diameter, and 10 g of weight). The testing was repeated, however, instead of 5 g of the respective liquid organotin catalyst and 0.5 g of water being placed in the glass beaker, the respective foam disks were placed onto the glass beaker.

7. With regard to the testing of the organotin catalysts, the dimethyltin dioleate produced 21.5 mg of fogging condensate, the dibutyltin dilaurate produced 194.2 mg of fogging condensate, and the dimethyltin dineodecanoate produced 234.4 mg of fogging condensate.
8. With regard to the testing of the polyurethane foams, the dimethyltin dioleate foam produced 1.15 mg of fogging condensate, the dibutyltin dilaurate foam produced 1.51 mg of fogging condensate, and the dimethyltin dineodecanoate foam produced 3.45 mg of fogging condensate.
9. It was surprising and unexpected that the dimethyltin dioleate catalyst produced better anti-fogging results when compared to the dibutyltin dilaurate catalyst. To the contrary, I would have expected the smaller R groups of the dimethyltin dioleate catalyst to have greater emissivity and, thus, greater amounts of fogging condensate.
10. In preparing the above-identified patent application, I also reviewed U.S. Patent No. 4,332,927 to Simone ("Simone").
11. The teachings of Simone are not directed to the problem of fogging or emissivity into air of polyurethane compounds and Simone does not provide a solution to the problem of

fogging or emissivity into air of polyurethane compounds. Further, dioctyltin, as taught by Simone, has a lower activity and inferior catalytic activity when compared with dimethyltin.

12. I, the undersigned, hereby declare under penalty of perjury that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



Dr. Oliver Schumacher

17-03-2009

Date